APPENDIX C

GREYCLIFF EASTBOUND					
Design Year		Existing (2007)	Projected 10YR (2017)	Projected 20YR (2027)	
TRAFFIC DATA	A =	**5,113**	**7,212**	**10,174**	One-way, design year, average daily traffic (ADT); From Total AADT numbers provided by MDT
	B = Ratio of design hourly volume to ADT				
	B_1 =	767	1,082	1,526	Cars, generally = 0.15 (% x A)
	B_2 =	767	1,082	1,526	Trucks, when ADT < 12,500 = 0.15, when ADT > 12,500 = 0.10 (% x A)
	C = Traffic Composition in percent (from counts or estimates below)				
	From Current AADT Near Rest Area Locations, MDT, 2008.				
	% of Total AADT =	**76.51%**	**76.51%**	**76.51%**	Total Passenger & Bus (Types 1-4)
	% of Total AADT =	**23.49%**	**23.49%**	**23.49%**	Total Commercial (Types 5-13)
	% of Total AADT =	9%	9%	9%	Total cars w/ trailers or RVs (generally 4 to 9% of total traffic, use 9%)
	% of Total AADT =	67.51%	67.51%	67.51%	Cars (generally 75 to 89% of total traffic) (% x B_1, use total passenger & bus minus cars w/ trailers or RVs)
	C_1 =	518	730	1,030	Cars (% x B_1)
	C_2 =	69	97	137	Cars with trailers or RVs (% x B_1)
	C_3 =	180	254	358	Trucks (generally 7 to 16% of total traffic) (% x B_2, use total commercial)
	C =	767	1,082	1,526	Total traffic
	D = Vehicles per hour stopping at rest area				
	D_1 =	62	88	124	Cars per hour (% x C_1, use 12% typcial, 15% for max. scenario)
					(a) Near commercial or metro area, 9%
					(b) Typical rural route, 12%
					(c) Information and Welcome Centers, 9 to 15%
	D_2 =	6	9	12	Cars with trailers or RVs, 9 to 15% (% x C_2, use 9% typical, 15% for max. scenario)
	D_3 =	16	23	32	Trucks, 9 to 15% (% x C_3, use 9% typical, 15% for max. scenario)
	D =	**84**	**120**	**168**	**Total vehicles per hour**
		62	**88**	**124**	**Number of Passenger Cars and Buses Per Hour**
		22	**32**	**44**	**Number of Commercial Trucks Per Hour (includes cars with trailers or RVs)**
PARKING SPACES	M = Total Parking Spaces				
	Based on the Peak Factor (PF) of 1.8 and the average length of stay (VHS) indicated; M = 1.8 (VHS/60)				
	M_1 =	28	40	56	Cars, based on average 15 min. stops = 0.45 (0.45 x D_1)
	M_2 =	3	4	5	Cars with trailers, based on average 15 min. stops = 0.45 (0.45 x D_2)
	M_3 =	10	14	19	Trucks, based on average 20 min. stops = 0.60 (0.60 x D_3)
	M =	**41**	**58**	**80**	**Total Parking Spaces**
		13	**18**	**24**	**Recommended Number of Truck Parking Spots**
		28	**40**	**56**	**Recommended Number of Auto Parking Spots**
RESTROOM STALLS	UV =	1.3	1.3	1.3	Restroom users per vehicle
	PF =	1.8	1.8	1.8	Peak Factor
	UHF =	30	30	30	Restroom users per hour per fixture based on 2-min. cycle
	T =	7	9	13	Total toilets and urinals; T = (D x UV x PF)/ UHF
	T_w =	**4**	**5**	**8**	**Number of women's toilets (T x 0.60)**
	T_m =	**3**	**4**	**5**	**Number of men's toilets and urinals (T x 0.40)**
WATER USAGE	PHD =	**11**	**16**	**23**	**Peak Hourly Demand, gpm; PHD = (D x UV x PF x 3.5 gallons per user)/ 60**
SITE FACILITIES	PT =	**16**	**23**	**32**	**Picnic Tables, (0.40 x M)**
	R =	**12**	**17**	**24**	**Waste Receptacles (0.30 x M)**

		GREYCLIFF WESTBOUND			
Design Year		**Existing (2007)**	**Projected 10YR (2017)**	**Projected 20YR (2027)**	
TRAFFIC DATA	A =	**5,094**	**7,186**	**10,136**	One-way, design year, average daily traffic (ADT); From Total AADT numbers provided by MDT
	B = Ratio of design hourly volume to ADT				
	B_1 =	764	1,078	1,520	Cars, generally = 0.15 (% x A)
	B_2 =	764	1,078	1,520	Trucks, when ADT < 12,500 = 0.15, when ADT > 12,500 = 0.10 (% x A)
	C = Traffic Composition in percent (from counts or estimates below)				
	From Current AADT Near Rest Area Locations, MDT, 2008.				
	% of Total AADT =	**76.62%**	**76.62%**	**76.62%**	Total Passenger & Bus (Types 1-4)
	% of Total AADT =	**23.38%**	**23.38%**	**23.38%**	Total Commercial (Types 5-13)
	% of Total AADT =	9%	9%	9%	Total cars w/ trailers or RVs (generally 4 to 9% of total traffic, use 9%)
	% of Total AADT =	67.62%	67.62%	67.62%	Cars (generally 75 to 89% of total traffic) (% x B_1, use total passenger & bus minus cars w/ trailers or RVs)
	C_1 =	517	729	1,028	Cars (% x B_1)
	C_2 =	69	97	137	Cars with trailers or RVs (% x B_1)
	C_3 =	179	252	355	Trucks (generally 7 to 16% of total traffic) (% x B_2, use total commercial)
	C =	764	1,078	1,520	Total traffic
	D = Vehicles per hour stopping at rest area				
	D_1 =	62	87	123	Cars per hour (% x C_1, use 12% typcial, 15% for max. scenario)
					(a) Near commercial or metro area, 9%
					(b) Typical rural route, 12%
					(c) Information and Welcome Centers, 9 to 15%
	D_2 =	6	9	12	Cars with trailers or RVs, 9 to 15% (% x C_2, use 9% typical, 15% for max. scenario)
	D_3 =	16	23	32	Trucks, 9 to 15% (% x C_3, use 9% typical, 15% for max. scenario)
	D =	**84**	**119**	**167**	**Total vehicles per hour**
		62	**87**	**123**	**Number of Passenger Cars and Buses Per Hour**
		22	**32**	**44**	**Number of Commercial Trucks Per Hour (includes cars with trailers or RVs)**
PARKING SPACES	M = Total Parking Spaces				
	Based on the Peak Factor (PF) of 1.8 and the average length of stay (VHS) indicated; M = 1.8 (VHS/60)				
	M_1 =	28	39	55	Cars, based on average 15 min. stops = 0.45 (0.45 x D_1)
	M_2 =	3	4	5	Cars with trailers, based on average 15 min. stops = 0.45 (0.45 x D_2)
	M_3 =	10	14	19	Trucks, based on average 20 min. stops = 0.60 (0.60 x D_3)
	M =	**41**	**57**	**79**	**Total Parking Spaces**
		13	**18**	**24**	**Recommended Number of Truck Parking Spots**
		28	**39**	**55**	**Recommended Number of Auto Parking Spots**
RESTROOM STALLS	UV =	1.3	1.3	1.3	Restroom users per vehicle
	PF =	1.8	1.8	1.8	Peak Factor
	UHF =	30	30	30	Restroom users per hour per fixture based on 2-min. cycle
	T =	7	9	13	Total toilets and urinals; T = (D x UV x PF)/ UHF
	T_w =	**4**	**5**	**8**	**Number of women's toilets (T x 0.60)**
	T_m =	**3**	**4**	**5**	**Number of men's toilets and urinals (T x 0.40)**
WATER USAGE	PHD =	**11**	**16**	**23**	**Peak Hourly Demand, gpm; PHD = (D x UV x PF x 3.5 gallons per user)/ 60**
SITE FACILITIES	PT =	**16**	**23**	**32**	**Picnic Tables, (0.40 x M)**
	R =	**12**	**17**	**24**	**Waste Receptacles (0.30 x M)**

		CUSTER			
Design Year		**Existing (2007)**	**Projected 10YR (2017)**	**Projected 20YR (2027)**	
TRAFFIC DATA	A =	**1,995**	**2,814**	**3,970**	One-way, design year, average daily traffic (ADT); From Total AADT numbers provided by MDT
	B = Ratio of design hourly volume to ADT				
	B_1 =	299	422	595	Cars, generally = 0.15 (% x A)
	B_2 =	299	422	595	Trucks, when ADT < 12,500 = 0.15, when ADT > 12,500 = 0.10 (% x A)
	C = Traffic Composition in percent (from counts or estimates below)				
	From Current AADT Near Rest Area Locations, MDT, 2008.				
	% of Total AADT =	**73.11%**	**73.11%**	**73.11%**	Total Passenger & Bus (Types 1-4)
	% of Total AADT =	**26.89%**	**26.89%**	**26.89%**	Total Commercial (Types 5-13)
	% of Total AADT =	9%	9%	9%	Total cars w/ trailers or RVs (generally 4 to 9% of total traffic, use 9%)
	% of Total AADT =	64.11%	64.11%	64.11%	Cars (generally 75 to 89% of total traffic) (% x B_1, use total passenger & bus minus cars w/ trailers or RVs)
	C_1 =	192	271	381	Cars (% x B_1)
	C_2 =	27	38	54	Cars with trailers or RVs (% x B_1)
	C_3 =	80	113	160	Trucks (generally 7 to 16% of total traffic) (% x B_2, use total commercial)
	C =	299	422	595	Total traffic
	D = Vehicles per hour stopping at rest area				
	D_1 =	23	32	46	Cars per hour (% x C_1, use 12% typcial, 15% for max. scenario)
					(a) Near commercial or metro area, 9%
					(b) Typical rural route, 12%
					(c) Information and Welcome Centers, 9 to 15%
	D_2 =	2	3	5	Cars with trailers or RVs, 9 to 15% (% x C_2, use 9% typical, 15% for max. scenario)
	D_3 =	7	10	14	Trucks, 9 to 15% (% x C_3, use 9% typical, 15% for max. scenario)
	D =	**32**	**45**	**65**	**Total vehicles per hour**
		23	**32**	**46**	**Number of Passenger Cars and Buses Per Hour**
		9	**13**	**19**	**Number of Commercial Trucks Per Hour (includes cars with trailers or RVs)**
PARKING SPACES	M = Total Parking Spaces				
	Based on the Peak Factor (PF) of 1.8 and the average length of stay (VHS) indicated; M = 1.8 (VHS/60)				
	M_1 =	10	14	21	Cars, based on average 15 min. stops = 0.45 (0.45 x D_1)
	M_2 =	1	1	2	Cars with trailers, based on average 15 min. stops = 0.45 (0.45 x D_2)
	M_3 =	4	6	8	Trucks, based on average 20 min. stops = 0.60 (0.60 x D_3)
	M =	**15**	**21**	**31**	**Total Parking Spaces**
		5	**7**	**10**	**Recommended Number of Truck Parking Spots**
		10	**14**	**21**	**Recommended Number of Auto Parking Spots**
RESTROOM STALLS	UV =	1.3	1.3	1.3	Restroom users per vehicle
	PF =	1.8	1.8	1.8	Peak Factor
	UHF =	30	30	30	Restroom users per hour per fixture based on 2-min. cycle
	T =	2	4	5	Total toilets and urinals; T = (D x UV x PF)/ UHF
	T_w =	**1**	**2**	**3**	**Number of women's toilets (T x 0.60)**
	T_m =	**1**	**2**	**2**	**Number of men's toilets and urinals (T x 0.40)**
WATER USAGE	PHD =	**4**	**6**	**9**	**Peak Hourly Demand, gpm; PHD = (D x UV x PF x 3.5 gallons per user)/ 60**
SITE FACILITIES	PT =	**6**	**8**	**12**	**Picnic Tables, (0.40 x M)**
	R =	**5**	**6**	**9**	**Waste Receptacles (0.30 x M)**

			HYSHAM		
Design Year		Existing (2007)	Projected 10YR (2017)	Projected 20YR (2027)	
TRAFFIC DATA	A =	**2,265**	**3,195**	**4,507**	One-way, design year, average daily traffic (ADT); From Total AADT numbers provided by MDT
	B = Ratio of design hourly volume to ADT				
	B_1 =	340	479	676	Cars, generally = 0.15 (% x A)
	B_2 =	340	479	676	Trucks, when ADT < 12,500 = 0.15, when ADT > 12,500 = 0.10 (% x A)
	C = Traffic Composition in percent (from counts or estimates below)				
	From Current AADT Near Rest Area Locations, MDT, 2008.				
	% of Total AADT =	**80.62%**	**80.62%**	**80.62%**	Total Passenger & Bus (Types 1-4)
	% of Total AADT =	**19.38%**	**19.38%**	**19.38%**	Total Commercial (Types 5-13)
	% of Total AADT =	9%	9%	9%	Total cars w/ trailers or RVs (generally 4 to 9% of total traffic, use 9%)
	% of Total AADT =	71.62%	71.62%	71.62%	Cars (generally 75 to 89% of total traffic) (% x B_1, use total passenger & bus minus cars w/ trailers or RVs)
	C_1 =	244	343	484	Cars (% x B_1)
	C_2 =	31	43	61	Cars with trailers or RVs (% x B_1)
	C_3 =	66	93	131	Trucks (generally 7 to 16% of total traffic) (% x B_2, use total commercial)
	C =	340	479	676	Total traffic
	D = Vehicles per hour stopping at rest area				
	D_1 =	29	41	58	Cars per hour (% x C_1, use 12% typcial, 15% for max. scenario)
					(a) Near commercial or metro area, 9%
					(b) Typical rural route, 12%
					(c) Information and Welcome Centers, 9 to 15%
	D_2 =	3	4	5	Cars with trailers or RVs, 9 to 15% (% x C_2, use 9% typical, 15% for max. scenario)
	D_3 =	6	8	12	Trucks, 9 to 15% (% x C_3, use 9% typical, 15% for max. scenario)
	D =	**38**	**53**	**75**	**Total vehicles per hour**
		29	**41**	**58**	**Number of Passenger Cars and Buses Per Hour**
		9	**12**	**17**	**Number of Commercial Trucks Per Hour (includes cars with trailers or RVs)**
PARKING SPACES	M = Total Parking Spaces				
	Based on the Peak Factor (PF) of 1.8 and the average length of stay (VHS) indicated; M = 1.8 (VHS/60)				
	M_1 =	13	18	26	Cars, based on average 15 min. stops = 0.45 (0.45 x D_1)
	M_2 =	1	2	2	Cars with trailers, based on average 15 min. stops = 0.45 (0.45 x D_2)
	M_3 =	4	5	7	Trucks, based on average 20 min. stops = 0.60 (0.60 x D_3)
	M =	**18**	**25**	**35**	**Total Parking Spaces**
		5	**7**	**9**	**Recommended Number of Truck Parking Spots**
		13	**18**	**26**	**Recommended Number of Auto Parking Spots**
RESTROOM STALLS	UV =	1.3	1.3	1.3	Restroom users per vehicle
	PF =	1.8	1.8	1.8	Peak Factor
	UHF =	30	30	30	Restroom users per hour per fixture based on 2-min. cycle
	T =	3	4	6	Total toilets and urinals; T = (D x UV x PF)/ UHF
	T_w =	**2**	**2**	**4**	**Number of women's toilets (T x 0.60)**
	T_m =	**1**	**2**	**2**	**Number of men's toilets and urinals (T x 0.40)**
WATER USAGE	PHD =	**5**	**7**	**10**	**Peak Hourly Demand, gpm; PHD = (D x UV x PF x 3.5 gallons per user)/ 60**
SITE FACILITIES	PT =	**7**	**10**	**14**	**Picnic Tables, (0.40 x M)**
	R =	**5**	**8**	**11**	**Waste Receptacles (0.30 x M)**

RAUsage.xls
5/14/2009

HATHAWAY				
Design Year	**Existing (2007)**	**Projected 10YR (2017)**	**Projected 20YR (2027)**	

		Existing (2007)	Projected 10YR (2017)	Projected 20YR (2027)	
TRAFFIC DATA	$A =$	**2,265**	**3,195**	**4,507**	One-way, design year, average daily traffic (ADT); From Total AADT numbers provided by MDT
	B = Ratio of design hourly volume to ADT				
	$B_1 =$	340	479	676	Cars, generally = 0.15 (% x A)
	$B_2 =$	340	479	676	Trucks, when ADT < 12,500 = 0.15, when ADT > 12,500 = 0.10 (% x A)
	C = Traffic Composition in percent (from counts or estimates below)				
	From Current AADT Near Rest Area Locations, MDT, 2008.				
	% of Total AADT =	**76.00%**	**76.00%**	**76.00%**	Total Passenger & Bus (Types 1-4)
	% of Total AADT =	**24.00%**	**24.00%**	**24.00%**	Total Commercial (Types 5-13)
	% of Total AADT =	9%	9%	9%	Total cars w/ trailers or RVs (generally 4 to 9% of total traffic, use 9%)
	% of Total AADT =	67.00%	67.00%	67.00%	Cars (generally 75 to 89% of total traffic) (% x B_1, use total passenger & bus minus cars w/ trailers or RVs)
	$C_1 =$	228	321	453	Cars (% x B_1)
	$C_2 =$	31	43	61	Cars with trailers or RVs (% x B_1)
	$C_3 =$	82	115	162	Trucks (generally 7 to 16% of total traffic) (% x B_2, use total commercial)
	$C =$	340	479	676	Total traffic
	D = Vehicles per hour stopping at rest area				
	$D_1 =$	27	39	54	Cars per hour (% x C_1, use 12% typcial, 15% for max. scenario)
					(a) Near commercial or metro area, 9%
					(b) Typical rural route, 12%
					(c) Information and Welcome Centers, 9 to 15%
	$D_2 =$	3	4	5	Cars with trailers or RVs, 9 to 15% (% x C_2, use 9% typical, 15% for max. scenario)
	$D_3 =$	7	10	15	Trucks, 9 to 15% (% x C_3, use 9% typical, 15% for max. scenario)
	D =	**37**	**53**	**74**	**Total vehicles per hour**
		27	**39**	**54**	**Number of Passenger Cars and Buses Per Hour**
		10	**14**	**20**	**Number of Commercial Trucks Per Hour (includes cars with trailers or RVs)**
PARKING SPACES	M = Total Parking Spaces				
	Based on the Peak Factor (PF) of 1.8 and the average length of stay (VHS) indicated; M = 1.8 (VHS/60)				
	$M_1 =$	12	18	24	Cars, based on average 15 min. stops = 0.45 (0.45 x D_1)
	$M_2 =$	1	2	2	Cars with trailers, based on average 15 min. stops = 0.45 (0.45 x D_2)
	$M_3 =$	4	6	9	Trucks, based on average 20 min. stops = 0.60 (0.60 x D_3)
	M =	**17**	**26**	**35**	**Total Parking Spaces**
		5	**8**	**11**	**Recommended Number of Truck Parking Spots**
		12	**18**	**24**	**Recommended Number of Auto Parking Spots**
RESTROOM STALLS	UV =	1.3	1.3	1.3	Restroom users per vehicle
	PF =	1.8	1.8	1.8	Peak Factor
	UHF =	30	30	30	Restroom users per hour per fixture based on 2-min. cycle
	T =	3	4	6	Total toilets and urinals; T = (D x UV x PF)/ UHF
	$T_w =$	**2**	**2**	**4**	**Number of women's toilets (T x 0.60)**
	$T_m =$	**1**	**2**	**2**	**Number of men's toilets and urinals (T x 0.40)**
WATER USAGE	PHD =	**5**	**7**	**10**	**Peak Hourly Demand, gpm; PHD = (D x UV x PF x 3.5 gallons per user)/ 60**
SITE FACILITIES	PT =	**7**	**10**	**14**	**Picnic Tables, (0.40 x M)**
	R =	**5**	**8**	**11**	**Waste Receptacles (0.30 x M)**